WHAT IS CLAIMED IS:

1. A device for suturing an end of a first body duct to a hole in the side of a second body duct, said device comprising:

a structure for holding the end of the first body duct and positioning said end adjacent to the hole in the side of the second body duct; and

a plurality of needles arranged on the structure to be advanced along a plurality of paths wherein each path first passes radially into and forwardly out of the end of the first body duct and into the hole of the second body duct and then everts so that the needles will pass outwardly through tissue peripheral to the hole when the end of the first body duct is on the structure adjacent to the hole in the second body duct.

2. A device as in claim 1, wherein the structure comprises a shaft.

3. A device as in claim 2, wherein the shaft has a surface adapted to receive the first body duct.

4. A device as in claim 3, wherein said surface comprises a cylindrical surface adapted to received the first body duct.

5. A device as in claim 2, wherein the shaft has a tubular surface against which the needles are positioned to guide said needles along a portion of said path.

6. A device as in claim 2, wherein the shaft further comprises a plunger for advancing said needles through the first body duct.

7. A device as in claim 6, wherein the plunger includes suture storage for a plurality of sutures each coupled to one of said plurality of needles.

8. A device as in claim 6, wherein the plunger comprises a plurality of elongate members for advancing said needles through the first body duct.

9. A device as in claim 8, wherein the elongate members comprise tubes each containing a suture coupled to one of said needles.

10. A device as in claim 1, wherein the structure comprises a plurality of guide channels which define said plurality of paths.

11. A device as in claim 10, wherein the guide channels are arranged in a radial configuration about a shaft of said structure.

12. A device as in claim 10, wherein the guide channels comprise guide tubes.

13. A device as in claim 10, wherein the guide channels have a longitudinal slot along a length of at least of one said guide channels.

14. A device as in claim 10, wherein the guide channels each have a first portion and a second portion, wherein the first and second portions are separated by a gap which receives the end of the first body duct.

15. A device as in claim 10, wherein at least one of said guide channels has a substantially curved configuration so that one of said needles passing through said guide channel will evert to pass outwardly through tissue peripheral to the hole when the end of the first body duct is on the structure adjacent to the hole in the second body duct.

16. A device as in claim 14, wherein the second portion of the guide channel comprises a guide tube having a J-shaped section for guiding one of said needles along a portion of said path.

17. A device as in claim 16, wherein the second portion of the guide channel tube has a longitudinal slot extending along the length of the guide tube having a J-shaped section.

18. A device as in claim 14, wherein the first body duct has a lumen, a body duct wall, and an outer surface, and wherein:

the first portion of the guide channel is adapted to be positioned outside the first body duct and has a distal opening positioned to open towards an outer surface of the first body duct when the first body duct is mounted on the structure; and

the second portion of the guide channel is adapted to be positioned in the lumen of the first body duct when the first body duct is mounted on the structure, said second portion of the guide channel receiving one of said needles advanced from the first portion and passing through the body duct wall.

19. A device as in claim 18, wherein the second portion of the guide channel has a J-shaped configuration.

20. A device as in claim 18, wherein the second portion of the guide channel includes a longitudinal slot extending the length of the second portion.

21. A device as in claim 18, wherein the needles are of sufficient length to extend from the first portion of the guide channel, through the second portion, and through the tissue layer of the second body duct.

22. A device as in claim 1, wherein said needles comprise a shape-memory alloy.

23. A device as in claim 1, wherein said needles comprise a superelastic material.

24. A device as in claim 1, wherein:

said needles each have an arcuate profile when unconstrained;

said structure comprises a tubular constraint having a lumen surface, wherein the needles are movable between a first position within the tubular constraint where said needles have a substantially straight configuration and a second position within the constraint wherein said needles extend beyond the tubular constraint and assume said arcuate profile.

25. A device as in 24, wherein said tubular constraint comprises an inner tube coaxially mounted with an outer tube, said needles mounted on the distal end of the inner tube wherein said inner tube is movable between a first and second position with the outer tube.

26. A device as in claim 1, wherein the structure comprises:

an outer tube having a passage; and

an inner tube slidably mounted in the passage of the outer tube and having the needles fixedly secured to a distal end thereof, said needles adapted to penetrate one end of the first body duct when the body duct is mounted within said inner tube.

27. A device as in claim 26, wherein:

said needles each have an arcuate profile when unconstrained;

said inner tube is movable between a first position within the outer tube where said needles have a substantially straight configuration and a second position within the outer tube wherein said needles extend beyond the outer tube and assume said arcuate profile.

28. A device as in claim 26, wherein the inner tube has an opening in a wall of the inner tube spaced apart from a distal end of the inner tube, said opening allowing for the insertion of the first body duct into a lumen of the inner tube.

29. A device as in claim 26, wherein the inner tube is coupled to a plunger which reciprocates said inner tube between a forwardly advanced position and a retracted position.

30. A device as in claim 26, wherein the outer tube and inner tube are in coaxial alignment and have a slideable relationship relative to each other.

31. A device as in claim 26, wherein each of said needles has a suture attached to the distal end of said needles.

32. A device as in claim 26, wherein the needles have arcuate shape memory so that they evert as they are advanced forward.

33. A device as in claim 32, wherein the needles have a sharpened tip pointing proximally when the needles are in a substantially curved configuration.

34. A device as in claim 32, wherein said needles comprise a shape memory material.

35. A device as in claim 26, wherein the needles in said second position has a length sufficient to extend from the inner tube through a wall of the second body duct such that a sharpened tip of the needle penetrates completely through said wall.

36. A device as in claim 26, wherein the needles have a releasable connection with said inner tube.

37. A device as in claim 1, further comprising means for guiding said needles through the first and second body ducts.

38. A device as in claim 37, wherein the means for guiding the needles comprises a plurality of guide channels.

39. A device as in claim 37, wherein the means for guiding the needles comprises a plurality of needles having an arcuate profile when unconstrained and mounted within a tubular constraint, said needles movable between a first position where the tubular constraint forces the needles to a substantially straight configuration and a second position wherein the needle assumes a configuration exhibiting said arcuate profile.

40. A method for suturing an end of a first body duct to a hole in the side of a second body duct, said method comprising:

positioning the end of the first body duct adjacent to the hole in the second body duct;

advancing a plurality of needles carrying a plurality of sutures along a plurality of paths, wherein each path first passes radially into and forwardly out of the end of the first body duct and into the hole of the second body duct and then everts so that the needles will pass outwardly through tissue peripheral to the hole when the end of the first body duct is on the structure adjacent to the hole in the second body duct; and

securing a portion of at least one of said sutures outside of the first body duct to a portion of the suture outside of the peripheral tissue surrounding the hole in the second body duct.

41. A method as in claim 40, wherein said positioning step includes mounting said first body duct against a shaft structure containing said plurality of needles.

42. A method as in claim 40, wherein advancing the needles comprises passing the needles through guide channel which define the paths.

43. A method as in claim 42, wherein the guide channels each have a first portion and a second portion, where the first and second portions are separated by a gap which receives the end of the first body duct.

44. A method as in claim 43, wherein advancing said needle comprises passing said needle through said first portion of the guide channels, through the wall of said first body duct, and into said second portion of the guide channels.

45. A method as in claim 40, wherein advancing the needles comprises unconstraining said needles so that the each needles assume an arcuate, everted configuration as they are passed forwardly.

46. A method as in claim 40, wherein advancing the needles comprises using a plunger having a tubular structure releasably coupled to said needle to push said needle along said path.

47. A method as in claim 40, wherein securing the sutures comprises removing said sutures from said guide channels by lifting the sutures out of the channels through a longitudinal slot running along a length of each of said guide channels.

48. A method as in claim 40, further comprising:

providing a suturing device having an inner tube coaxially mounted within an outer tube, where at least one of said needles is made of a shape-memory alloy and is mounted on the inner tube; and

extending said needles beyond the outer tube by relative motion between the needle and the outer tube, said needle extended to a configuration where a sharpened tip of the needle points substantially in a proximal direction.

49. A method as in claim 40, further comprising lifting said shaft structure in a proximal direction to pull the needles through the peripheral tissue surrounding the hole in the second body duct.

50. A method as in claim 40, further comprising everting the first body duct over said needles.

51. A method as in claim 40, further comprising using a breakaway catheter to facilitate introduction of the shaft structure into the second body duct.

52. A method as in claim 40, wherein securing said sutures comprises:

collecting sutures carried near a sharpened tip of said needles; and

tying off the sutures to connect the body ducts together.

53. A method as in claim 40, wherein the second body duct comprises an artery.

54. A method as in claim 40, wherein the second body duct comprises the aorta.

55. A method as in claim 40, wherein said advancing and securing steps are performed on a beating heart.

56. A method as in claim 40, wherein said advancing and securing steps are performed on a stopped heart.

57. A method as in claim 40, wherein said positioning, advancing, and securing steps are performed minimally invasively.

58. A method as in claim 40, wherein said positioning, advancing, and securing steps are performed in an open surgery environment.

59. A method as in claim 40, wherein said positioning, advancing, and securing steps are performed through minimally invasive percutaneous openings in a chest of a patient.

60. A method for suturing an end of a first body duct to a hole in the side of a second body duct, said method comprising:

using a needle driver to simultaneously pass a plurality of sutures through the end of the first body duct, inwardly through the hole of the second body duct, and outwardly through peripheral tissue surrounding the hole in the second body duct; and

securing a portion of the suture outside of the first body duct to a portion of the suture outside of the peripheral tissue surrounding the hole in the second body duct.

61. A method as in claim 60, wherein a plunger is used to pass a plurality of needles through the end of the first body duct, wherein each of said needles carries one of said sutures.

62. A kit comprising:

a graft suturing device adapted to deliver a plurality of needles;

instructions for use in suturing an end of a first body duct to a hole in the side of a second body duct comprising using the graft anastomosis device to simultaneously advance a plurality of needles radially into and forwardly out of the end of the first body duct and into the hole of the second body duct and then evert so that the needles will pass outwardly through tissue peripheral to the hole when the end of the first body duct is on the device adjacent to the hole in the second body duct; and

a package adapted to contain the device and the instructions for use.